Volume 26 Study AFS-41

STATE OF ALASKA

Bill Sheffield, Governor

Annual Performance Report for

STATUS OF IMPORTANT NATIVE CHINOOK SALMON STOCKS IN SOUTHEAST ALASKA

by

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RESEARCH PROJECT SEGMENT

State: Alaska Name: Sport Fish Investigations of Alaska

Project: F-9-17

Study: AFS-41 Study Title: A STUDY OF CHINOOK SALMON IN SOUTHEAST ALASKA

Job: AFS-41-12(A) Job Title: Status of Important Native Chinook Salmon Stocks in Southeast Alaska

Cooperator: Paul D. Kissner

Period Covered: July 1, 1984 to June 30, 1985

ABSTRACT

The 1984 escapement of chinook salmon, *Oncorhynchus tshawytscha* (Walbaum), to various tributaries of the transboundary Taku River was nearly twice as large as the 1983 escapement but was only 23.5% of the escapement goal. The 6-year-old chinook in the 1984 escapement were the last year-class severely affected by the landslide on the Inklin River during December 1978.

The return of chinook salmon to the Little Tahltan River, the major index tributary of the transboundary Stikine River, was over 100% higher than the 1983 escapement. However, it was still disappointing because, between April 16 and June 4 the commercial troll fishery throughout southeast Alaska, the terminal gill net fisheries in southeast Alaska, and in-river gill net fisheries in Canada were closed to protect Stikine River sockeye, *Oncorhynchus nerka* (Walbaum).

The escapement of chinook was also disappointing in the transboundary Alsek River; however, escapements were uniformly good in other index tributaries monitored annually in Southeast.

Based on year-class data, it appears that the 1985 return of 6-year-old chinook to Southeast systems will be excellent, and, the return of 5-year-olds will be average or better.

A total of 12,252 age-0 chinook smolts in the Situk River were adipose-fin clipped and micro-wire tagged during 1984. Additionally, 9,391 Age-1 chinook smolts were tagged in the Unuk River and 5,799 Age-1 chinook smolts were tagged in the Chickamin River to determine their migration patterns, areas and timing of harvest, exploitation rates, and other general life-history information. An additional 35,017 sockeye smolts and 20,706 coho, *Oncorhynchus kisutch* (Walbaum), smolts, were captured incidentally, adipose-fin clipped, and micro-wire tagged.

Loss of juvenile chinook salmon habitat associated with log-salvage practices on the Unuk and Chickamin Rivers is discussed.

Recovery of coded-wire tags continued to indicate that Taku chinook complete ocean rearing beyond our fisheries and then migrate through Icy Straits during the spring of their final year of life as they return to the Taku River spawning grounds.

Based on 22 fishery recoveries of micro-wire tagged Stikine chinook, the major areas of harvest are Commercial Statistical Areas 109-110 (40%) and 113 (35%). It appears that upriver Stikine chinook races also rear offshore, while Andrew Creek chinook (lower Stikine River) transplanted to Crystal Lake Hatchery contribute well in inside waters and at various stages of maturity.

KEYWORDS

Chinook, *Oncorhynchus tshawytscha* (Walbaum), escapement, juveniles, migration, status, log salvage, Taku, Stikine, Alsek, Unuk, Chickamin, Situk, Chilkat, southeast Alaska.

BACKGROUND

The chinook salmon research project commenced in 1971 to determine the status of southeast Alaska's wild chinook salmon stocks. Major emphasis has been placed on monitoring chinook population dynamics, i.e., terminal gill-net harvests, escapement, coded-wire tagging, and recovery of tags from the fishery and on the spawning grounds in highly productive and moderately productive river systems.

By the mid-1970s, it was apparent that chinook salmon populations were generally depressed throughout Southeast, and during subsequent years, terminal gill-net fisheries were either severely restricted or eliminated on the Taku, Stikine, and Alsek Rivers. Additional sport-and commercial-trolling restrictions have been made to protect mature chinook during their spring spawning migration. These restrictive regulations have aided the rebuilding process, and escapement levels have, in general, shown dramatic improvement.

A list of common names, scientific names, and abbreviations of all species discussed in this report is presented in Table 1.

Table 1. List of Common Names, Scientific Names, and Abbreviations.

Common Name	Scientific Name	Abbreviation
Chinook salmon	*Oncorhynchus tshawytscha* (Walbaum)	KS
Coho salmon	*Oncorhynchus kisutch* (Walbaum)	SS
Sockeye salmon	*Oncorhynchus nerka* (Walbaum)	RS
Dolly Varden	*Salvelinus malma* (Walbaum)	DV

RECOMMENDATIONS

Management

1. The restrictive troll and gill-net regulations designed to protect mature southeast Alaska chinook salmon returning to their rivers of origin should be continued. Southeast Alaska chinook salmon stocks are in the process of rebuilding, but continued restrictions are necessary.

2. Drift-gill-net fisheries throughout Southeast should be monitored to determine the harvest of immature and mature chinook salmon taken incidentally to the target species. Night closures should be made in areas where high incidental catches of immature chinook salmon occur.

3. Operations designed to remove large organic debris should not be permitted in Southeast's chinook salmon producing rivers. Chinook populations are in the process of rebuilding, and it is essential to maximize rearing habitat in order to maximize chinook production.

Research

1. Sampling of the commercial and sport harvest of chinook to recover coded-wire tags should continue. Recovery of chinook tagged in the Taku, Stikine, Alsek, Unuk, Chickamin, and Situk Rivers will permit determination of marine-migration patterns, areas and timing of harvest at various life-history stages, and rates of harvest.

2. Length frequency and scale sampling of spawning chinook salmon in the highly productive and moderately productive rivers should be conducted to determine the quality of the various escapements and to forecast future returns.

3. Determine the current status of highly productive and moderately productive chinook salmon systems in Southeast through monitoring of escapements by aerial, ground, and/or weir enumeration. This is necessary to determine if the various closures designed to aid depressed Southeast chinook salmon are effective.

OBJECTIVES

1. Determine the current status of the Taku River chinook salmon population.

2. Determine the current status of the Stikine River chinook salmon populations.

3. Determine the current status of the Alsek River chinook salmon population.

4. Determine the current status of seven moderately productive chinook salmon systems in southeast Alaska.

TECHNIQUES USED

Escapement surveys were conducted on foot or from Bell 206 or Hughes 500D helicopters during peak spawning. The helicopter flew 6-15 m above the river bed at 8-16 km/hr. The observer's door was removed, and the helicopter hovered sideways with observations made from the open space.

Whenever possible, the sun was kept behind the helicopter, and the observer wore Polaroid sunglasses to eliminate severe reflection. Only 3- and 4-ocean chinook salmon (>660 mm in total length) were enumerated during aerial and foot surveys.

Only dead or nearly dead fish were sampled during foot surveys on the spawning grounds to collect age, length, and sex-determination data and to recover coded-wire-tagged chinook. Chinook of all sizes and ages were randomly sampled.

Chinook were measured from mid-eye to fork of tail, and scales were collected for age determination. Scales were taken from the preferred area at the posterior edge of the dorsal fin, two rows above the lateral line. Because of the high occurrence of regeneration in chinook scales, several additional scales were removed from the preferred area on the other side of the fish and placed in numbered coin envelopes.

From July 31 to August 25, a tripod weir was operated by the Canadian Department of Fisheries and Oceans on the Nakina River 137 m above its junction with the Silver Salmon River. Chinook spawning above the weir were enumerated after they could no longer maintain station in the river and floated against the weir face. The structure was cleaned of carcasses at 8 a.m. and 7 p.m. daily. All species were enumerated and length data, scale samples and sex determinations were collected from the chinook salmon. Chinook were also examined for missing adipose fins, which indicated the presence of a coded-wire tag. Upriver surveys were conducted daily to enumerate and sample spawned-out chinook salmon which had not floated downriver to the weir. The survey area extended 2.4 km above the Nakina weir.

Gee minnow traps baited with clusters of salmon roe were used to capture juvenile salmonids in the Unuk and Chickamin Rivers. Fifty to one hundred traps were checked daily, the juveniles removed, and the traps rebaited and reset. Salmon roe was disinfected before use by immersion for 15 minutes in Betadyne diluted to 1 part Betadyne per 90 parts water.

Large schools of juvenile salmonids were observed in various holes in the lower Situk River, then seined with a 30-m beach seine (3 m deep,

0.63-cm mesh). This method was used from May 21 through mid-June and was very effective in capturing sockeye and coho smolts.

We observed large numbers of Age-0 chinook moving into the area beginning in mid-June. We changed our capture technique because of the increased density of chinook salmon; the change also reduced the incidental capture of sockeye and coho smolts. Chinook were chummed with salmon roe into shallow water, near a gravel bar adjacent to a pool, and netted with a seine (4.6 m long by 2 m deep, 0.63-cm mesh) against or with the current, depending upon the situation.

Juvenile chinook tagged in the rivers were transported from various capture sites to the tagging locations in live boxes and, after tagging, were usually released above or below the trapping areas to reduce the number of recaptured fish.

Chinook salmon smolts and rearing juveniles were anesthetized with tricaine methanesulfonate (MS-222), marked by removal of the adipose fin, and micro-wire tagged with a Northwest Marine Technology, Inc. (NMT) tag injector. The tagging unit was modified to function under remote conditions by conversion to a 24-volt battery system.

The micro-wire tags were made of type 302 stainless-steel wire and were 0.25 mm in diameter and 1.0 mm in length. A code, based on the binary system, was etched into the surface of each wire to identify the agency tagging and the specific treatment of the individual fish.

The micro-wire tags must be implanted in the cartilaginous wedge of the fish's snout to obtain maximum retention. Thus, several fish were sampled daily to ensure proper tag placement. The fish's skull was bisected by a vertical incision through the dorsal median plane to the oral cavity. The tag was then readily observed in the snout. If the tag was improperly placed, adjustments in the depth of the head mold were made and several more fish were checked to ensure proper placement of the tag.

The micro-wire tags were magnetized by dropping the tagged fish head through a ring magnet into a bucket of water. The fish were then passed through a NMT field-sampling detector to check for the presence of a magnetized tag.

Chinook and coho smolts and rearing juveniles were sampled for age and growth determination. Fish were measured from the tip of the snout to the fork of the tail (to the nearest millimeter) and several scales were taken from the preferred area and mounted between glass slides.

Adult scales were examined under a binocular microscope, and the first complete scale was cleansed in detergent and mounted on a numbered gum card. The scales were pressed in cellulose acetate and analyzed on a 3-M Consultant 114 microfiche reader.

FINDINGS

Taku River Studies

Escapement:

The escapement of chinook salmon to the Taku River during 1984 was nearly twice as large as the 1983 escapement and nearly 20% greater than the 10-year average, but it was still only 23.5% of the escapement goal (Table 2). This was somewhat disappointing because commercial-trolling in Southeast was closed from April 16 through June 4.

The Age-6 chinook in the 1984 escapement were the last year-class severely affected by the landslide on the Inklin River in December 1978. Based on length frequencies and age data collected at the Nakina Carcass Weir (Tables 3-5), the 1985 return of Age-6 chinook to the Taku River should be excellent, and the return of Age-5 chinook should be about average. However, it is not anticipated that the escapement goal will be achieved.

Coded-Wire-Tag Recovery:

Recoveries of coded-wire tags from chinook tagged as smolts or young-of-the-year continue to indicate that Taku River chinook rear beyond Alaska's fisheries and migrate through Icy Straits during the spring of their final year of life as they return to the Taku River spawning grounds (Tables 6 and 7). Recoveries from chinook tagged in the ocean in various areas of Southeast by Parker and Kirkness (unpublished) and Bethers (1981) show a similar trend.

Over 88% of all coded-wire-tag recoveries in the various troll fisheries occurred in Areas 111, 113, 114 and 116, which are the approaches to Icy Straits, and the Juneau Area.

All gill-net recoveries were made in Taku Inlet. Four seined 1-ocean chinook from the 1979 brood were recovered in July and August 1982. Possibly some brood stocks remain within inside waters for a longer time than others before moving offshore to rear.

Stikine River Studies

Escapement:

The 1984 escapement of chinook salmon to the Little Tahltan River was more than 100% greater than the 1983 escapement, was near the previous 9-year mean escapement, but was only 62% of the escapement goal (Table 8)-- A somewhat disappointing escapement level, considering that commercial trolling in Southeast Alaska was closed from April 16 to June 4 and the terminal gill-net fishery in southeast Alaska and the in-river gill-net fishery in Canada were closed to protect Stikine sockeye salmon.

Table 2. Peak-Escapement Counts of Chinook Salmon in the Taku River Tributaries. G = Glacial Water; E = Clear Water.

Year	Nakina	Kowatua	Tatsamenie	Dudidontu	Tseta	Nahlin	Total
1951	5,000	...	...	400	100	1,000	6,500
1952	9,000	...	...	...	...	...	9,000
1953	7,500	...	...	...	...	...	7,500
1954	6,000	...	...	...	...	...	6,000
1955	3,000	...	...	...	...	...	3,000
1956	1,380	...	...	...	...	...	1,380
1957	1,500*	...	...	...	...	...	1,500
1958	2,500*	...	...	4,500	...	2,500	9,500
1959	4,000*	...	...	...	...	...	4,000
1960	Poor	...	...	...	...	...	Poor
1961	Poor	...	...	...	...	...	Poor
1962	...	...	...	25	81	216	322
1963	...	...	...	...	...	...	...
1964	...	...	...	...	...	...	...
1965	3,050	200 G	50 G	100	18	37	3,455
1966	...	14 G	150 G	267	150	300	881
1967	...	250 G	...	600	350	300	1,500
1968	...	1,100 E	800 E	640	230	450	3,220
1969	...	3,300 E	800 E	...	...	...	4,100
1970	...	1,200 E	530 E	10	25	26	1,791
1971	...	1,400 E	320 E	165	...	473	2,358
1972	1,000	130 G	170 G	103	80	280	1,763
1973	2,000	100 G	200 G	200	...	300	2,800
1974	1,800	235 G	120 G	20	4	900	3,079
1975	1,800	...	...	15	...	274	2,089
1976	3,000	341 G	620 E	40	...	725	4,726
1977	3,850	580 G	573 E	18	...	650	5,671
1978	1,620	490 G	550 E	...	21	624	3,305
1979	2,110	430 G	750 E	9	...	857	4,156
1980	4,500	450 G	905 E	158	...	1,531	7,544
1981	5,110	560 G	839 E	74	258	2,945	9,786
1982	2,533	289 E	387 E	130	228	1,246	4,813
1983	968	171 E	236 E	117	179	391	2,062
1984	1,887	279 E	616 E	...	176**	951***	3,909

* Carcasses were counted at the weir. The river was not surveyed.

** Only upper 2 miles of the tributary were surveyed.

*** Surveyed only above Beaver Dam Valley. A total of 521 chinook were counted. Adjustments were made for total area using spawner-distribution data collected in past years as follows: Above dams = 54.8%; in dams = 23.2%; and below dams to Telegraph Trail = 22.0%.

Table 3. Length Frequency of Female Chinook Sampled at the Nakina Carcass Weir.

Mid-Eye to Fork (mm)	1956	1957	1958	1959*	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
575	7	3	0	3	0	0	0	1	0	0	0	0	0	0	0	0
600	3	5	2	6	0	0	0	2	0	0	0	0	0	0	0	0
625	6	3	9	10	0	2	0	2	0	0	0	1	0	0	0	2
650	16	20	13	17	2	2	0	4	2	0	2	1	3	0	0	2
675	29	17	38	42	3	1	3	9	4	1	5	14	6	3	1	5
700	4	28	66	93	10	22	8	21	13	6	12	27	27	7	5	11
725	46	49	55	142	17	21	3	25	38	1	34	47	33	16	7	35
750	69	56	76	192	43	53	12	60	66	8	39	69	69	26	19	33
775	66	52	67	197	59	52	4	51	112	13	44	82	86	46	25	18
800	87	125	87	238	112	90	16	71	175	28	51	99	153	68	37	33
825	28	29	36	156	108	64	11	56	203	26	34	77	186	96	62	27
850	15	13	21	71	150	70	7	51	219	36	19	98	201	107	46	27
875	4	2	5	18	77	28	4	22	171	41	17	75	150	124	32	16
900	3	1	2	5	22	11	0	6	96	33	8	49	109	76	31	10
925	0	0	0	1	6	4	1	3	34	11	5	9	28	44	5	3
950	1	0	1	0	3	0	0	0	8	2	1	6	12	21	6	2
975	0	0	0	0	2	0	0	1	2	1	0	0	3	8	0	3
Total	424	403	478	1,191	614	420	69	385	1,143	207	271	654	1,066	642	276	227

* No data collected between 1960 and 1972.

Table 4. Length Frequency of Male Chinook Sampled at the Nakina Carcass Weir.

Mid-Eye to Fork (mm)	1956	1957	1958	1959*	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
200	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225	3	1	3	3	1	0	1	0	0	0	0	0	0	0	0	0
250	34	26	46	20	7	10	1	3	2	1	1	6	1	7	2	1
275	141	96	162	132	24	100	31	7	54	36	24	35	14	64	37	4
300	235	168	289	328	114	274	73	27	290	462	134	102	52	270	163	34
325	362	305	301	275	108	254	80	16	432	853	267	175	51	330	288	82
350	82	66	262	120	97	143	52	10	343	616	180	107	42	161	201	66
375	57	64	192	41	68	41	32	12	142	239	65	39	32	22	66	30
400	83	144	202	61	71	56	63	15	46	86	48	18	23	15	53	14
425	129	131	215	98	99	68	81	28	44	36	94	25	35	19	119	15
450	330	365	207	111	120	110	76	32	50	63	188	47	39	27	167	40
475	146	141	271	132	94	107	72	57	35	100	204	64	45	41	180	40
500	140	165	262	170	100	94	57	57	41	150	288	99	62	27	210	68
525	103	113	202	148	91	68	46	71	32	162	208	88	40	22	156	61
550	138	136	145	182	93	55	28	69	28	147	168	86	42	40	109	63
575	46	60	86	99	78	44	31	52	21	97	97	80	54	29	77	70
600	36	30	70	100	49	49	18	39	15	102	81	60	41	23	64	66
625	56	77	68	71	38	31	14	35	24	33	34	52	38	27	23	52
650	22	30	89	90	39	36	14	34	22	18	36	59	44	29	16	63
675	17	26	69	86	27	25	9	28	33	14	36	49	40	18	16	43
700	44	43	67	87	35	42	9	34	48	8	40	48	55	39	16	50
725	21	16	35	68	34	37	10	32	52	9	58	48	57	44	17	43
750	24	18	29	66	37	45	9	22	67	10	53	49	59	29	16	41
775	46	56	29	62	28	21	12	26	62	4	37	30	39	39	21	30
800	19	27	27	58	27	23	12	16	50	5	34	43	46	39	16	24
825	19	24	22	81	28	21	8	21	26	10	22	20	29	40	15	14
850	11	8	29	66	35	16	13	13	48	13	22	27	39	35	20	10
875	7	7	12	68	39	21	5	14	42	10	8	25	47	39	18	6
900	1	0	9	37	49	17	13	11	57	11	7	27	57	46	25	8
925	0	0	3	14	35	16	7	12	46	20	14	25	49	40	23	3
950	0	0	2	4	24	8	7	11	46	9	7	28	49	39	16	5
975	0	0	0	1	22	11	3	6	41	20	8	27	45	49	27	6
Total	2,353	2,343	3,405	2,879	1,711	1,843	887	810	2,239	3,344	2,463	1,588	1,266	1,649	2,177	1,052

* No data collected between 1960 and 1972.

Table 5. Number and Age of Male and Female Chinook Salmon Enumerated in the Nakina River, by Brood Year.

Age	1951	1952	1953	1954	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
									MALE									
1.1	...	...	1,886	1,662	...	...	806	1,945	2,498	368	2,704	8,277	2,014	1,801	519	1,823	1,232	662
1.2	...	2,201	2,623	4,229	...	1,395	1,464	3,743	1,816	652	3,512	4,035	2,009	1,169	528	1,773	1,306	...
1.3	476	569	1,030	1,212	511	599	790	980	696	528	1,119	1,438	1,064	560	288	973	...	...
1.4	82	177	441	...	228	420	334	703	279	176	637	939	584	227	226	...	...	...
1.5	0	0	...	...	9	17	15	30	6	0	0	17	6	4	...	...	...	...
Total	...	...	5,980	...	...	...	3,409	7,401	5,295	1,724	7,972	14,706	5,677	3,761	1,561	...	...	...
									FEMALE									
1.3	532	514	829	1,310	302	375	118	654	388	155	552	957	577	192	85	264	...	...
1.4	335	464	1,037	...	591	463	1,014	2,024	601	245	1,468	2,512	1,144	352	409	...	...	...
1.5	0	0	...	...	0	0	23	27	12	0	18	32	6	11	...	...	...	...
Total	867	978	1,866	...	893	838	1,155	2,705	1,001	400	2,038	3,501	1,727	555	494	...	...	...

Table 6. A Summary of Coded-Wire-Tag Releases of Taku River Chinook Salmon, 1977 to Date.

Tag code	Number Released: Young-of-year	Number Released: Smolts	Brood Year	Mean Size (mm)	Capture Location	Percent Tag Retention
4-5-8	0	5,294	1977	79.7	Main-stem Taku R. Tagged April-May 1977 at Taku Lodge.	87.2
4-5-9	0	4,555	1975	79.7	Main-stem Taku R. Tagged May 1977 at Taku Lodge.	87.2
4-5-10	0	53	1975	79.7	Main-stem Taku R. Tagged May 1977 at Taku Lodge.	87.2
4-16-55	10,687	0	1979	68.7	Glacial Nakina River. Tagged at Inklin Jct., Oct. 1980.	96.7
4-16-56	4,101	0	1979	68.4	Taku River. Tagged at Inklin Jct., Oct. 1980.	96.7
4-16-57	1,498	0	1979	68.7	Glacial Nakina River. Tagged at Inklin Jct., Nov. 1980.	96.7
4-16-58	5,594	0	1978	64.8	Main-stem Taku R. Tagged at Tulsequah, Sept. 1979.	82.4
4-16-59	1,066	0	1978	68.2	Glacial Nakina River. Tagged at Inklin Jct., Oct. 1979.	82.4
4-16-60	4,821	0	1978	64.8	Main-stem Taku R. & Glacial Nakina R. Tagged at Inklin Jct. & Tulsequah, Oct. 1979.	82.4

Table 6. (Cont.) A Summary of Coded-Wire-Tag Releases of Taku River Chinook Salmon, 1977 to Date.

Tag Code	Number Released: Young-of-year	Number Released: Smolts	Brood Year	Mean Size (mm)	Capture Location	Percent Tag Retention
4-16-61	0	1,573	1978	84.3	Taku Inlet. Tagged at Juneau, May 1980.	...
4-16-62	0	2,549	1977	66.2	Main-stem Taku R. Tagged at Tulsequah, April 1979.	91.7
4-16-63	3,517	0	1979	68.4	Glacial Nakina River. Tagged at Inklin Jct., Sept. 1980.	96.7
4-17-8	5,092	0	1976	68.5	Nahlin River, Tagged Sept. 1977.	...
4-17-9	3,402	0	1976	68.5	Nahlin River, Tagged Sept. 1977.	...
4-17-10	4,358	0	1976	62.9	Main-stem Taku R. Tagged at Tulsequah, Oct. 1977.	...
4-17-11	4,468	0	1976	62.9	Main-stem Taku R. Tagged at Tulsequah, Oct. 1977.	...
4-17-12	4,796	0	1976	62.9	Main-stem Taku R. Tagged at Tulsequah, Oct. 1977.	...
4-17-13	6,134	0	1976	62.9	Main-stem Taku R. Tagged at Tulsequah, Oct. 1977.	...
4-17-14	2,123	0	1976	62.9	Main-stem Taku R. Tagged at Tulsequah, Oct. 1977.	...

Table 6. (Cont.) A Summary of Coded-Wire-Tag Releases of Taku River Chinook Salmon, 1977 to Date.

Tag Code	Number Released		Brood Year	Mean Size (mm)	Capture Location	Percent Tag Retention
	Young-of-year	Smolts				
4-17-21	0	4,778	1976	70.3	Main-stem Taku R. Tagged at Tulsequah, April 1978.	...
4-17-22	0	3,717	1976	70.3	Main-stem Taku R. Tagged at Tulsequah, May 1978.	...
4-17-23	0	666	1976	70.3	Main-stem Taku R. Tagged at Tulsequah, May 1978.	...
4-17-24	0	389	1976	70.3	Main-stem Taku R. Tagged at Canyon Island, May 1978.	...
4-17-28	31,376	0	1977	63.9	Main-stem Taku R. Tagged at Tulsequah, Oct. 1978.	...
4-17-30	7,740	0	1977	63.9	Main-stem Taku R. Tagged at Tulsequah, Oct. 1978.	...
4-19-20	0	3,531	1979	83.8	Taku Inlet Seining May & June 1981.	96.2
4-19-59	8,881	0	1978	68.2	Glacial Nakina River, Tagged at Inklin Jct., Oct. 1979.	82.4
4-19-60	10,590	0	1979	68.7	Glacial Nakina River, Tagged at Inklin Jct., Sept. 1980.	96.7

Table 6. (Cont.) A Summary of Coded-Wire-Tag Releases of Taku River Chinook Salmon, 1977 to Date.

Tag Code	Number Released		Brood Year	Mean Size (mm)	Capture Location	Percent Tag Retention
	Young-of-year	Smolts				
4-19-61	9,983	0	1979	68.7	Glacial Nakina River. Tagged at Inklin Jct., Sept. 1980.	96.7
4-20-1	0	1,633	1979	73.5	Tulsequah, May 1981.	95.2
4-20-3	0	4,218	1979	67.7	Tulsequah, March through May 1981.	95.2
4-20-56	0	4,710	1981	87.9	Taku Inlet.	
4-21-15	5,252	0	1980	63.2	Glacial Nakina River, Sept. 1981.	95.5
4-21-16	9,995	0	1980	59.8	Main-stem Taku R. Sept. & Oct. 1981.	95.5
4-21-17	10,566	0	1980	59.8	Main-stem Taku R. Oct. 1981.	95.5
4-21-18	6,260	0	1980	59.8	Main-stem Taku R. Oct. & Nov. 1981.	95.5
4-21-20	10,539	0	1980	63.2	Glacial Nakina River, Sept. 1981.	95.5

Table 7. A Summary of Coded-Wire-Tag Recoveries of Taku River Chinook Salmon, 1978 to Date. Abbreviations in Parentheses are Head Length (-), Fork Length (FL), Mid-Eye Fork Length (MF), and Total Length (TL).

Tag code	Date	Age	Sex	Length (mm)	Recovery type and area	Random or select	Expansion factor
4-5-8	8-10-78	1.1	M	360 (MF)	Nakina R. escapement	R	...
	8-13-78	1.1	M	330 (MF)	Nakina R. escapement	R	...
	8-15-78	2.1	M	410 (MF)	Nakina R. escapement	R	...
	8-18-78	1.1	M	295 (MF)	Nakina R. escapement	R	...
	8-23-78	1.1	M	355 (MF)	Nakina R. escapement	R	...
	5-17-79	1.2	...	683 (FL)	Comm. Troll 513	R	...
	7-12-79	1.2	...	659 (FL)	Comm. Gill-net 111	R	...
	8-13-79	1.2	M	575 (MF)	Nakina R. escapement	R	...
	8-16-79	1.2	M	480 (MF)	Nakina R. escapement	R	...
	8-18-79	1.2	M	545 (MF)	Nakina R. escapement	R	...
	8-18-79	1.2	M	420 (MF)	Nakina R. escapement	R	...
	5-20-80	1.3	...	175 (-)	Comm. Troll 113, 114, 116	S	...
	5-21-80	1.3	...	175 (-)	Comm. Troll 113, 114, 116	S	...
	5-30-80	1.3	...	885 (FL)	Comm. Troll 113	R	...
	6-10-80	1.3	...	780 (FL)	Comm. Troll 113, 114, 116	R	...
	6-18-80	1.3	...	170 (-)	Comm. Troll 113, 114, 116	S	...
	6-20-80	1.3	...	850 (FL)	Comm. Gill-net 111	R	...
	6-26-80	1.3	...	853 (FL)	Comm. Gill-net 111	R	...
	8-15-80	1.3	M	755 (MF)	Nakina R. escapement	R	...
	8-14-80	1.3	F	760 (MF)	Nakina R. escapement	R	...
	8-15-80	1.3	M	735 (MF)	Nakina R. escapement	R	...
	8-16-80	1.3	...	660 (MF)	Nakina R. escapement	R	...
	6-13-81	1.4	...	996 (FL)	Comm. Troll 109-50	R	...
	5-20-81	1.4	...	900 (FL)	Comm. Troll 113, Deer Harbor	R	...
	5-10-81	1.4	...	997 (FL)	Sport Fish 111, Breadline		
	8-03-81	1.4	...	...	Nahlin R. escapement	R	...
	8-18-81	1.4	F	790 (MF)	Nakina R. escapement	R	...
	8-14-81	1.4	F	865 (MF)	Nakina R. escapement	R	...
	8-19-81	1.4	F	855 (MF)	Nakina R. escapement	R	...
4-5-9	7-27-78	1.1	M	330 (MF)	Nakina R. escapement	R	...
	8-04-78	1.1	M	310 (MF)	Nakina R. escapement	R	...
	8-15-78	1.1	M	335 (MF)	Nakina R. escapement	R	...
	8-16-78	1.1	M	310 (MF)	Nakina R. escapement	R	...
	8-20-78	1.1	M	330 (MF)	Nakina R. escapement	R	...
	7-05-79	1.2	M	595 (FL)	Comm. Gill-net 111	R	...
	7-05-79	1.2	M	579 (FL)	Comm. Gill-net 111	R	...
	7-12-79	1.2	M	650 (FL)	Comm. Gill-net 111	R	...
	8-12-79	1.2	M	535 (MF)	Nakina R. escapement	R	...

Table 7. (Cont.) A Summary of Coded-Wire-Tag Recovery of Taku River Chinook Salmon, 1978 to Date. Abbreviations in Parentheses are Head Length (-), Fork Length (FL), Mid-Eye Fork Length (MF), and Total Length (TL).

Tag code	Date	Age	Sex	Length (mm)	Recovery type and area	Random or select	Expansion factor
	08/15/79	1.2	M	515 (MF)	Nakina R. escapement	R	...
	08/16/79	1.2	M	570 (MF)	Nakina R. escapement	R	...
	08/18/79	1.2	M	420 (MF)	Nakina R. escapement	R	...
	05/20/80	1.3	M	853 (FL)	Comm. Troll 113,114,116	R	...
	05/20/80	1.3	...	765 (FL)	Comm. Troll 114	S	...
	05/21/80	1.3	...	175 (-)	Comm. Troll 113,114,116	S	...
	06/18/80	1.3	...	790 (FL)	Comm. Gill-net 111	R	...
	06/19/80	1.3	...	730 (FL)	Comm. Gill-net 111	R	...
	05/10/81	1.4	...	914 (FL)	Sport Fish 111, Pt. Stephens	R	
	05/21/81	1.4	...	915 (FL)	Comm. Troll, Deer Harbor Scow	R	...
	08/03/81	1.4	...		Nahlin-escapement	R	...
	08/13/81	1.4	F	870 (MF)	Nakina R. escapement	R	...
	08/07/81	1.4	F	890 (MF)	Nakina R. escapement	R	...
	08/08/81	1.4	F	860 (MF)	Nakina R. escapement	R	...
	08/12/81	1.4	M	780 (MF)	Nakina R. escapement	R	...
	08/11/81	1.4	F	815 (MF)	Nakina R. escapement	R	...
	08/11/81	1.4	M	895 (MF)	Nakina R. escapement	R	...
	08/05/81	1.4	F	850 (MF)	Nakina R. escapement	R	...
4-16-55	07/28/82	1.1	...	410 (FL)	Comm. Seine 112	R	...
	08/03/82	1.1	...	390 (FL)	Comm. Seine,Unknown	R	...
	08/10/82	1.1	M	330 (MF)	Nakina R. escapement	R	...
	08/10/82	1.1	M	295 (MF)	Nakina R. escapement	R	...
	08/11/82	1.1	M	290 (MF)	Nakina R. escapement	R	...
	08/12/82	1.1	M	335 (MF)	Nakina R. escapement	R	...
	08/11/83	1.2	M	485 (MF)	Nakina R. escapement	R	...
	08/14/83	1.2	M	500 (MF)	Nakina R. escapement	R	...
	08/14/83	1.2	M	550 (MF)	Nakina R. escapement	R	...
	08/15/83	1.2	M	450 (MF)	Nakina R. escapement	R	...
	08/16/83	1.2	M	490 (MF)	Nakina R. escapement	R	...
	08/17/83	1.2	M	445 (MF)	Nakina R. escapement	R	...
	08/18/83	1.2	M	450 (MF)	Nakina R. escapement	R	...
	08/18/83	1.2	M	520 (MF)	Nakina R. escapement	R	...
	08/18/83	1.2	M	510 (MF)	Nakina R. escapement	R	...
	08/19/83	1.2	M	400 (MF)	Nakina R. escapement	R	...
	08/21/83	1.2	M	450 (MF)	Nakina R. escapement	R	...
	08/22/83	1.2	M	355 (MF)	Nakina R. escapement	R	...
	08/11/83	1.2	M	625 (MF)	Little Tahltan R. escapement	R	...
	05/20/84	1.3	...	740 (FL)	Test Troll 112	R	...
	06/14/84	1.3	...	790 (FL)	Comm. Troll 114	R	...
	06/15/84	1.3	...	750 (FL)	Comm. Troll, landed Ex I.	S	...

Table 7. (Cont.) A Summary of Coded-Wire-Tag Recovery of Taku River Chinook Salmon, 1978 to Date. Abbreviations in Parentheses are Head Length (-), Fork Length (FL), MId-Eye Fork Length (MF), and Total Length (TL).

Tag code	Date	Age	Sex	Length (mm)	Recovery type and area	Random or select	Expansion factor
	06/27/84	1.3	...	790 (FL)	Comm. Gill-net 111-32	R	...
	07/31/84	1.3	M	650 (MF)	Nakina R. escapement	R	...
	08/10/84	1.3	M	695 (MF)	Nakina R. escapement	R	...
	08/10/84	1.3	F	665 (MF)	Nakina R. escapement	R	...
	08/11/84	1.3	M	600 (MF)	Nakina R. escapement	R	...
	08/12/84	1.3	M	735 (MF)	Nakina R. escapement	R	...
	08/16/84	1.3	M	610 (MF)	Nakina R. escapement	R	...
4-16-56	08/15/82	1.1	M	305 (MF)	Nakina R. escapement	R	...
	09/04/83	1.2	M	535 (MF)	Tatsamenie R. escapement	R	...
	06/19/84	1.3	...	625 (FL)	Comm. Gill-net 111	R	...
4-16-57	08/04/83	1.2	M	585 (MF)	Nakina R. escapement	R	...
	08/10/83	1.2	M	495 (MF)	Nakina R. escapement	R	...
	08/13/83	1.2	M	555 (MF)	Nakina R. escapement	R	...
	08/13/83	1.2	M	490 (MF)	Nakina R. escapement	R	...
	08/16/83	1.2	M	455 (MF)	Nakina R. escapement	R	...
	08/18/83	1.2	M	450 (MF)	Nakina R. escapement	R	...
	04/12/84	1.3	...	760 (FL)	Comm. Troll 116	R	...
	08/11/84	1.3	M	700 (MF)	Nakina R. escapement	R	...
	08/17/84	1.3	M	605 (MF)	Nakina R. escapement	R	...
4-16-58	08/07/82	1.2	M	500 (MF)	Nakina R. escapement	R	...
	08/20/82	1.2	M	455 (MF)	Nakina R. escapement	R	...
	08/12/83	1.3	M	625 (MF)	Nakina R. escapement	R	...
	08/13/83	1.3	F	750 (MF)	Nakina R. escapement	R	...
4-16-60	07/29/83	1.3	...	171 (-)	Comm. Troll, landed Petersburg	S	...
4-16-61	07/05/83	1.3	...	850 (FL)	Comm. Gill-net 111-32	R	...
	08/09/83	1.3	...	610 (MF)	Nakina R. escapement	R	...
	08/09/83	1.3	...	580 (MF)	Nakina R. escapement	R	...
	05/01/84	1.4	...	...	Comm. Troll 183-10	S	...
4-16-62	08/12/80	1.1	M	345 (MF)	Nakina R. escapement	R	...
	08/12/80	1.1	M	350 (MF)	Nakina R. escapement	R	...
	08/15/81	1.2	M	520 (MF)	Nakina R. escapement	R	...
	08/16/81	1.2	M	485 (MF)	Nakina R. escapement	R	...
	05/27/82	1.3	...	890 (FL)	Comm. Troll	R	1.63
	08/14/82	1.3	M	775 (MF)	Nakina R. escapement	R	...

Table 7. (Cont.) A Summary of Coded-Wire-Tag Recovery of Taku River Chinook Salmon, 1978 to Date. Abbreviations in Parentheses are Head Length (-), Fork Length (FL), Mid-Eye Fork Length (MF), and Total Length (TL).

Tag code	Date	Age	Sex	Length (mm)	Recovery type and area	Random or select	Expansion factor
	06/02/83	1.4	...	1,005 (FL)	Comm. Troll 113, 114,116,154,157, 181,189	R	...
	06/05/83	1.4	...	917 (FL)	Comm. Troll 113-91	R	...
4-16-63	08/13/83	1.2	M	485 (MF)	Nakina R. escapement	R	...
	07/14/84	1.3	...	705 (FL)	Comm. Troll 114	R	...
	08/07/84	1.3	M	655 (MF)	Nakina R. escapement	R	...
	08/14/84	1.3	M	780 (MF)	Nakina R. escapement	R	...
4-17-8	05/28/82	1.4	...	858 (FL)	Comm. Troll, Unknown - landed Pelican	R	...
	07/29/82	1.4	F	820 (MF)	Nahlin R. escapement	R	...
	08/04/82	1.4	F	925 (MF)	Nahlin R. escapement	R	...
4-17-9	09/04/80	1.2	...	156 (-)	Landed, Sitka	S	...
	08/03/81	1.3	...	...	Nahlin R. escapement	R	...
	07/29/82	1.4	F	810 (MF)	Nahlin R. escapement	R	...
	08/04/82	1.4	F	880 (MF)	Nahlin R. escapement	R	...
4-17-10	05/16/80	1.2	...	610 (TL)	Sport Fish 111, Breadline		
	06/08/82	1.4		1,000 (FL)	Comm. Troll 104	R	1.95
	08/16/82	1.4	F	865 (MF)	Nakina R. escapement	R	...
4-17-11	05/28/81	1.3	...	996 (FL)	Comm. Troll 508, Elfin Cove Scow	R	...
	08/08/81	1.3	M	700 (MF)	Nakina R. escapement	R	...
4-17-13	06/05/81	1.3	...	875 (FL)	Comm. Troll 513, Elfin Cove Scow	R	...
	05/09/82	1.4	...	965 (TL)	Sport Fish 111	S	...
	05/27/82	1.4	...	812 (FL)	Comm. Troll 113-91	R	3.48
4-17-21	08/11/79	1.1	M	310 (MF)	Nakina R. escapement	R	...
	08/13/79	1.1	M	310 (MF)	Nakina R. escapement	R	...
	08/20/79	1.1	M	310 (MF)	Nakina R. escapement	R	...
	08/15/80	1.2	M	520 (MF)	Nakina R. escapement	R	...
	05/21/81	1.3	...	880 (FL)	Comm. Troll 505, Deer Harbor Scow	R	...
	05/27/81	1.3	...	835 (FL)	Comm. Troll 113, Lisianski to Surge	R	...
	06/03/81	1.3	...	860 (FL)	Comm. Troll 116, Icy Point	R	...
	07/29/81	1.3	M	760 (MF)	Nakina R. escapement	R	...
	05/31/82	1.4	...	979 (FL)	Comm. Troll, Unknown - Landed in Hoonah	R	...

Table 7. (Cont.) A Summary of Coded-Wire-Tag Recovery of Taku River Chinook Salmon, 1978 to Date. Abbreviations in Parentheses are Head Length (-), Fork Length (FL), Mid-Eye Fork Length (MF), and Total Length (TL).

Tag code	Date	Age	Sex	Length (mm)	Recovery type and area	Random or select	Expansion factor
	08/08/82	1.4	F	825 (MF)	Nakina R. escapement	R	...
	08/09/82	1.4	M	890 (MF)	Nakina R. escapement	R	...
	08/12/84	1.4	M	920 (MF)	Nakina R. escapement	R	...
	08/19/82	1.4	F	835 (MF)	Nakina R. escapement	R	...
	08/14/83	2.4	M	975 (MF)	Nakina R. escapement	R	...
4-17-22	08/12/80	1.2	M	565 (MF)	Nakina R. escapement	R	...
	04/14/81	1.3	...	864 (TL)	Comm. Troll 114, Homeshore	S	...
	06/04/81	1.3	...	748 (FL)	Comm. Troll 505, Deer Harbor Scow	R	...
	05/02/81	1.3	...	813 (FL)	Sport Fish 111 Breadline		
	05/24/82	1.4	...	1,003 (FL)	Comm. Troll 110	R	3.84
	06/14/82	1.4	...	950 (FL)	Comm. Gill-net 111	R	2.07
	06/23/82	1.4	...	950 (FL)	Comm. Gill-net 111	R	1.36
	08/10/82	1.4	F	930 (MF)	Nakina R. escapement	R	...
4-17-23	06/27/82	1.4	...	1,020 (FL)	Comm. Troll 113	R	2.27
4-17-28	08/14/80	1.1	M	360 (MF)	Nakina R. escapement	R	...
	08/15/80	1.1	M	350 (MF)	Nakina R. escapement	R	...
	08/13/81	1.2	M	590 (MF)	Nakina R. escapement	R	...
	07/17/81	1.2	M	550 (MF)	Nakina R. escapement	R	...
	08/17/81	1.2	M	440 (MF)	Nakina R. escapement	R	...
	08/18/81	1.2	M	605 (MF)	Nakina R. escapement	R	...
	06/15/82	1.3	...	699 (FL)	Sport Fish 111	S	...
	08/11/82	1.3	M	775 (MF)	Nakina R. escapement	R	...
4-17-30	08/10/80	1.1	M	355 (MF)	Nakina R. escapement	R	...
	06/27/81	1.2	...	...	Comm. Troll, landed in Sitka	S	...
	07/12/82	1.3	...	718 (FL)	Comm. Troll, landed at Excursion inlet	R	0
4-19-20	08/03/82	1.1	...	344 (FL)	Comm. Seine 109	R	2.44
	09/05/82	1.1	...	387 (FL)	Sport Fish 111	S	...
	08/07/82	1.1	M	285 (MF)	Nakina R. escapement	R	...
	08/17/82	1.1	M	370 (MF)	Nakina R. escapement	R	...
	06/22/83	1.2	M	600 (MF)	Canyon Island	R	...
	08/11/83	1.2	M	520 (MF)	Nakina R. escapement	R	...
	08/12/83	1.2	M	475 (MF)	Nakina R. escapement	R	...
	08/15/83	1.2	M	480 (MF)	Nakina R. escapement	R	...
	08/16/83	1.2	M	450 (MF)	Nakina R. escapement	R	...
	08/16/83	1.2	M	500 (MF)	Nakina R. escapement	R	...
	08/17/83	1.2	M	500 (MF)	Nakina R. escapement	R	...
	08/17/83	1.2	M	480 (MF)	Nakina R. escapement	R	...

Table 7. (Cont.) A Summary of Coded-Wire-Tag Recovery of Taku River Chinook Salmon, 1978 to Date. Abbreviations in Parentheses are Head Length (-), Fork Length (FL), Mid-Eye Fork Length (MF), and Total Length (TL).

Tag code	Date	Age	Sex	Length (mm)	Recovery type and area	Random or select	Expansion factor
	08/18/83	1.2	M	500 (MF)	Nakina R.escapement	R	...
	08/19/83	1.2	M	465 (MF)	Nakina R. escapement	R	...
	03/31/84	1.3	...	800 (FL)	Comm. Troll 114	R	...
	04/15/84	1.3	...	750 (FL)	Comm. Troll 114-70,	R	...
	06/14/84	1.3	...	165 (TL)	landed Pelican	S	...
	06/27/84	1.3	...	743 (FL)	Comm. Gill-net 111-32	R	...
	06/27/84	1.3	...	835 (FL)	Comm. Gill-net 111-32	R	...
	07/04/84	1.3	...	721 (FL)	Comm. Gill-net a 111-32	R	...
	07/29/84	1.3	...	165 (TL)	landed Ex Inlet	S	...
	08/12/84	1.3	M	650 (MF)	Nakina R. escapement	R	...
4-19-59	08/11/81	1.1	M	300 (MF)	Nakina R. escapement	R	...
	08/16/81	1.1	M	310 (MF)	Nakina R. escapement	R	...
	08/12/82	1.2	M	600 (MF)	Nakina R. escapement	R	...
	08/14/82	2.1	M	325 (MF)	Nakina R. escapement	R	...
	08/19/82	2.1	M	330 (MF)	Nakina R. escapement	R	...
	08/19/82	1.2	M	500 (MF)	Nakina R. escapement	R	...
	06/01/83	1.3	M	205 (-)	Comm. Troll, landed in Pelican	S	...
	08/14/84	1.4	M	865 (MF)	Nakina R. escapement	R	...
4-19-60	08/13/82	1.1	M	300 (MF)	Nakina R. escapement	R	...
	08/14/82	1.1	M	355 (MF)	Nakina R. escapement	R	...
	08/15/82	1.1	M	345 (MF)	Nakina R. escapement	R	...
	08/16/82	1.1	M	320 (MF)	Nakina R. escapement	R	...
	08/07/83	1.2	M	600 (MF)	Nakina R. escapement	R	...
	08/08/83	1.2	M	470 (MF)	Nakina R. escapement	R	...
	08/12/83	1.2	M	470 (MF)	Nakina R. escapement	R	...
	08/14/83	1.2	M	475 (MF)	Nakina R. escapement	R	...
	08/16/83	1.2	M	445 (MF)	Nakina R. escapement	R	...
	08/18/83	1.2	M	585 (MF)	Nakina R. escapement	R	...
	08/18/83	1.2	M	450 (MF)	Nakina R. escapement	R	...
	08/19/83	1.2	M	530 (MF)	Nakina R. escapement	R	...
	08/10/84	1.3	M	660 (MF)	Nakina R. escapement	R	...
	08/12/84	1.3	M	800 (MF)	Nakina R. escapement	R	...
4-19-61	08/13/82	1.1	M	345 (MF)	Nakina R. escapement	R	...
	08/23/82	1.1	M	330 (MF)	Nakina R. escapement	R	...
	08/23/82	1.1	M	315 (MF)	Nakina R. escapement	R	...
	07/06/83	1.2	M	552 (MF)	Nakina R. sport	S	...
	08/09/83	1.2	M	565 (MF)	Nakina R. escapement	R	...
	08/09/83	1.2	M	355 (MF)	Nakina R. escapement	R	...
	08/10/83	1.2	M	435 (MF)	Nakina R. escapement	R	...

Table 7. (Cont.) A Summary of Coded-Wire-Tag Recovery of Taku River Chinook Salmon, 1978 to Date. Abbreviations in Parentheses are Head Length (-), Fork Length (FL), Mid-Eye Fork Length (MF), and Total Length (TL).

Tag code	Date	Age	Sex	Length (mm)	Recovery type and area	Random or select	Expansion factor
	08/11/83	1.2	M	475 (MF)	Nakina R. escapement	R	...
	08/14/83	1.2	M	530 (MF)	Nakina R. escapement	R	...
	08/15/83	1.2	M	420 (MF)	Nakina R. escapement	R	...
	08/17/83	1.2	M	450 (MF)	Nakina R. escapement	R	...
	08/20/83	1.2	M	465 (MF)	Nakina R. escapement	R	...
	08/21/83	1.2	M	465 (MF)	Nakina R. escapement	R	...
	08/22/83	1.2	M	510 (MF)	Nakina R. escapement	R	...
	08/22/83	1.2	M	450 (MF)	Nakina R. escapement	R	...
	06/15/84	1.3	...	755 (FL)	Comm. Troll 114	R	...
	06/27/84	1.3	...	795 (FL)	Comm. Troll 116	R	...
	08/05/84	1.3	F	735 (MF)	Nakina R. escapement	R	...
	08/07/84	1.3	M	625 (MF)	Nakina R. escapement	R	...
	08/11/84	1.3	M	640 (MF)	Nakina R. escapement	R	...
	08/15/84	1.3	M	725 (MF)	Nakina R. escapement	R	...
	08/17/84	1.3	M	660 (MF)	Nakina R. escapement	R	...
	08/20/84	1.3	F	810 (MF)	Nakina R. escapement	R	...
4-20-01	06/06/82	1.1	M	331 (FL)	Sport Fish 111	S	...
	08/19/82	1.1	M	290 (MF)	Nakina R. escapement	R	...
	08/19/82	1.1	M	355 (MF)	Nakina R. escapement	R	...
	08/13/83	1.2	M	490 (MF)	Nakina R. escapement	R	...
	08/21/83	1.2	M	440 (MF)	Nakina R. escapement	R	...
	08/22/83	1.2	M	420 (MF)	Nakina R. escapement	R	...
	09/01/83	1.2	M	510 (MF)	Tatsamenie R. escapement	R	...
4-20-03	08/01/82	1.1	M	340 (MF)	Nakina R. escapement	R	...
	08/02/82	1.1	...	393 (FL)	Comm. Seine 111	R	3.27
	08/15/82	1.1	M	335 (MF)	Nakina R. escapement	R	...
	08/16/82	1.1	M	310 (MF)	Nakina R. escapement	R	...
	08/16/82	1.1	M	320 (MF)	Nakina R. escapement	R	...
	08/17/82	1.1	M	345 (MF)	Nakina R. escapement	R	...
	08/21/82	1.1	M	350 (MF)	Nakina R. escapement	R	...
	08/21/82	1.1	M	410 (MF)	Nakina R. escapement	R	...
	08/08/83	1.2	M	470 (MF)	Nakina R. escapement	R	...
	08/11/83	1.2	M	460 (MF)	Nakina R. escapement	R	...
	08/11/83	1.2	M	420 (MF)	Nakina R. escapement	R	...
	08/15/83	1.2	M	555 (MF)	Nakina R. escapement	R	...
	08/19/83	1.2	M	435 (MF)	Nakina R. escapement	R	...
	08/28/83	1.2	M	525 (MF)	Tatsamenie R. escapement	R	...
	09/02/83	1.2	M	580 (MF)	Tatsamenie R. escapement	R	...

Table 7. (Cont.) A Summary of Coded-Wire-Tag Recovery of Taku River Chinook Salmon, 1978 to Date. Abbreviations in Parentheses are Head Length (-), Fork Length (FL), Mid-Eye Fork Length (MF), and Total Length (TL).

Tag code	Date	Age	Sex	Length (mm)	Recovery type and area	Random or select	Expansion factor
	04/13/84	1.3	...	710 (FL)	Comm. Troll 114-70	R	...
	06/18/84	1.3	...	690 (FL)	Comm. Troll 114	R	...
	06/18/84	1.3	...	880 (FL)	Landed Excursion Inlet	S	...
	06/27/84	1.3	...	840 (FL)	Comm. Troll 113	R	...
	08/15/84	1.3	M	730 (MF)	Nakina R. escapement	R	...
	08/21/84	1.3	M	540 (MF)	Nakina R. escapement	R	...
4-21-15	06/02/83	2.0	...	90 (FL)	Seine-Taku Inlet	R	...
	08/14/84	1.2	M	540 (MF)	Nakina R. escapement	R	...
4-21-16	08/12/83	1.1	M	360 (MF)	Nakina R. escapement	R	...
	09/04/83	1.1	M	380 (MF)	Tatsamenie R. escapement	R	...
	08/13/84	1.2	M	490 (MF)	Nakina R. escapement	R	...
	08/15/84	1.2	M	580 (MF)	Nakina R. escapement	R	...
4-21-17	08/09/83	1.1	M	320 (MF)	Nakina R. escapement	R	...
	08/16/84	1.2	M	610 (MF)	Nakina R. escapement	R	...
4-21-20	08/09/83	1.1	M	305 (MF)	Nakina R. escapement	R	...
	08/10/83	1.1	M	330 (MF)	Nakina R. escapement	R	...
	08/15/83	1.1	M	360 (MF)	Nakina R. escapement	R	...
	06/19/84	1.2	...	513 (FL)	Comm. Gill-net 111	R	...
	08/13/84	1.2	M	570 (MF)	Nakina R. escapement	R	...
				ADIPOSE-FIN CLIPPED. NO CODED-WIRE TAG			
	08/06/78	1.1	M	335 (MF)	4-5-8 or 4-5-9, Nakina R. escapement	R	...
	08/10/78	1.1	M	355 (MF)	4-5-8 or 4-5-9, Nakina R. escapement	R	...
	08/10/78	1.1	M	...	head missing, 4-5-8 or 4-5-9, Nakina R. escapement	R	...
	08/12/78	1.1	M	...	head missing, 4-5-8 or 4-5-9, Nakina R. escapement	R	...
	08/24/78	1.1	M	380 (MF)	4-5-8 or 4-5-9, Nakina R. escapement, tag lost	R	...
	08/06/79	1.2	M	...	Head missing, 4-5-8 or 4-5-9, Nakina R. escapement	R	...
	08/18/79	1.2	M	545 (MF)	4-5-8 or 4-5-9, Nakina R. escapement	R	...
	08/20/79	1.2	M	470 (MF)	4-5-8 or 4-5-9, Nakina R. escapement	R	...

Table 7. (Cont.) A Summary of Coded-Wire-Tag Recovery of Taku River Chinook Salmon, 1978 to Date. Abbreviations in Parentheses are Head Length (-), Fork Length (FL), Mid-Eye Fork Length (MF), and Total Length (TL).

Tag code	Date	Age	Sex	Length (mm)	Recovery type and area	Random or select	Expansion factor
	08/20/79	1.2	M	470 (MF)	Nakina R.escapement, 4-5-8 or 4-5-9, tag lost	R	...
	08/14/80	1.1	M	325 (MF)	Nakina R. escapement	R	...
	08/14/80	1.3	...	700 (MF)	Nakina R. escapement, 4-5-8 or 4-5-9, Tag lost	R	...
	08/12/80	...	...	560 (MF)	Nakina R. escapement	R	...
	08/14/80	...	...	600 (MF)	Nakina R. escapement	R	...
	08/19/81	...	...	760 (MF)	Nakina R. escapement	R	...
	08/07/81	...	...	740 (MF)	Nakina R. escapement	R	...
	08/15/81	...	...	740 (MF)	Nakina R. escapement	R	...
	08/11/81	...	...	520 (MF)	Nakina R. escapement	R	...
	08/11/81	...	...	680 (MF)	Nakina R. escapement	R	...
	08/07/81	1.4	...	900 (MF)	Head missing, Nakina R. escapement, 4-5-8 or 4-5-9,	R	...
	08/08/82	1.2	M	550 (MF)	Nakina R. escapement	R	...
	08/05/82	1.4	...	895 (MF)	Nakina R. escapement	R	...
	08/04/82	1.4	...	≅870 (MF)	Nahlin R. escapement, head missing	R	...
	07/29/82	1.4	F	875 (MF)	Nahlin R. escapement	R	...
	08/09/83	1.2	M	460 (MF)	Nakina R. escapement	R	...
	08/20/83	1.2	M	490 (MF)	Nakina R. escapement	R	...
	08/17/84	1.3	F	755 (MF)	Nakina R. escapement	R	...

* (TL) = Total Length

Table 8. Minimum Total Run of Chinook Salmon in the Stikine River Drainage.

Year	U. S. Gill-Net Catches* Through Mid-June	Canadian Gill-Net Catches* Comm & Food	Little Tahltan R.	Main-stem Tahltan R.	Beatty Creek	Andrew Creek	Total Run
1956	7,224	...	493	...	...	4,500	12,217
1957	5,703	...	199	...	...	3,000	8,902
1958	7,215	...	790	...	...	2,500	10,505
1959	8,410	...	198	...	...	150	8,758
1960	4,673	...	346	...	...	287	5,306
1961	5,222	...	...	...	...	103	5,325
1962	4,173	...	...	...	...	200	4,373
1963	203	...	...	...	...	402	605
1964	947	...	...	...	...	400	1,347
1965	1,683	...	...	85	...	...	1,768
1966	1,058	...	...	318	...	75	1,451
1967	3,466	...	800	...	...	30	4,296
1968	2,570	...	...	...	...	...	2,570
1969	1,965	...	...	...	...	...	1,965
1970	224	...	...	...	...	...	224
1971	2,078	...	...	...	...	350	2,428
1972	4,799	0	...	...	...	...	4,799
1973	5,649	200	...	...	...	61	5,910
1974	7,006	0	...	...	...	129	7,135
1975	1,534	1,024	700	2,908	...	260	6,426
1976	1,101	924	400	120	...	468	3,013
1977	274	100	800	0	...	534	1,708
1978	0	400	632	756	...	400	2,188
1979	0	1,625	1,166	2,118	...	382	5,291
1980	0	2,231	2,137	960	122	362	5,812
1981	0	1,558	3,334	1,852	558	629	7,931
1982	0	2,387	2,830	1,690	567	910	8,384
1983	0	2,063	594	453	83	444	3,637
1984	0	702	1,294	...	126	355	2,477

* United States and Canadian gill-net catches include both large and jack chinook, while escapement counts include only large chinook.

Because of the strength of the 1979 brood year in the 1983 and 1984 escapements, it is anticipated that the Stikine River will have a very strong return of chinook salmon in 1985.

A weir has operated on the south fork of Andrew Creek since 1976 to secure chinook brood stock for Crystal Lake Hatchery. Andrew Creek, a clear tributary of the glacial Stikine River, is about 22 km upstream from the river's mouth. During 1984, the weir was installed by the Fisheries Rehabilitation, Enhancement, and Development Division (FRED) on July 7. Chinook were enumerated until July 31, when it was determined that sufficient chinook from hatchery surpluses were available to meet brood stock needs. Personnel from the Division of Sport Fish operated the weir August 1-25. Comparison of various components of Andrew Creek chinook returns are presented in Table 9.

A chinook salmon escapement goal was developed in 1984 for Andrew Creek based on historical escapement data, spawning area, and knowledge of juvenile chinook life history. The current escapement goal of 750 3-ocean and 4-ocean chinook was developed so that the spawning area would be maximized by about 1,000 large chinook and fry, upon emergence, would mostly migrate into the Stikine River main stem to rear. Thus, the rearing capacity of the lower main stem Stikine is the factor limiting the production of Andrew Creek chinook. The rearing capacity will have a large, annual variation, depending on chinook and coho escapements upriver, the resulting juvenile production, and the downstream displacement of juveniles caused by competition.

Operation of the Andrew Creek weir is no longer necessary because Crystal Lake has sufficient chinook brood stocks returning to the hatchery annually. Foot and/or helicopter surveys will be conducted annually to determine the status of this stock.

Coded-Wire-Tag Recovery:

Based on 22 ocean recoveries of coded-wire tags from chinook tagged as smolts and young-of-the-year on the Stikine River, the major areas of harvest are Commercial Statistical Areas 109-110 (40%) and Area 113 (35%) (Tables 10-11).

Based on coded-wire-tag recoveries, Parker and Kirkness's tagging during the 1950's, and Bethers' tagging in Icy Straits in 1981, it appears that the majority of the upriver Stikine chinook rear offshore and return past Cape Ommaney as they migrate towards the Stikine River. Lesser numbers migrate through Icy Straits, turning south and moving down Chatham Straits, and probably still fewer move through the Juneau area and south through Stephens Passage.

Andrew Creek chinook stock at the Crystal Lake Hatchery have contributed at a much higher rate to inside fisheries than to outside fisheries and many of the fish are known to be immature. Thus, it appears that there may be a variation in migration and contribution between the upriver and downriver chinook races in the Stikine River.

Table 9. Andrew Creek Chinook Escapement, 1976–1984.

Year	Large ♂ through weir	Large ♂ Spawned for Crystal Lake Hatchery	Jacks through weir	Total female through weir	♀ Spawned for Crystal Lake Hatchery	Large Chinook Caught below weir	Total Escapement of Large Chinook A*	Total Escapement of Large Chinook B*	Date weir removed
1976	151	29	50	200	35	53	468	404	8/23
1977	224	24	36	172	47*	60	534	456	8/22
1978	165	5	75	178	7	45	400	388	8/09
1979	154	27	89	135	28	38	382	327	8/06
1980	80	39	272	160	42	41	362	281	8/13
1981	250	57	119	190	61	71	629	511	8/22
1982	224	109	124	300	166	111	910	635	8/21
1983	143	31	38	173	47	50	444	366	8/30
1984	124	0	200	191	0	40	355	355	8/25

a Estimate includes fish sppawning above weir, those spawned for Crystal Lake Hatchery or other Southeast chinook facilities, and those spawning below weir.

b Spawning in Andrew Creek (excludes egg take for Crystal Lake Hatchery).

* Excludes 7 mortalities

( ) Actual number not recorded. Estimate made by comparing of large chinook through weir versus spawning below weir during years this information was collected.

Table 10. A Summary of Coded-Wire-Tag Releases of Stikine River Chinook Salmon, 1978 to Date.

Tag Code	Young-of-the-Year Released	Smolts Released	Brood Year	Mean Size (mm)	Capture Location	Percent Tag Retention
4-16-33	...	507	1976	73.9	Main-stem Stikine R. tagged at river mouth by Coho Research, May 1980.	...
4-16-35	...	...	1976	...	Main-stem Stikine R., at least one juvenile chinook tagged with a coho code.	...
4-16-54	6,677	...	1978	64.4	Main-stem Stikine R. near Porcupine mouth.	...
4-17-16	...	357	1976	73.9	Main-stem Stikine R. near Iskut mouth.	...
4-17-17	...	420	1976	73.9	Main-stem Stikine R. near Iskut R. mouth.	
4-17-20	5,223	...	1977	63.6	Little Tahltan R.	...
4-17-25	2,819	...	1977	63.6	Little Tahltan R.	...
4-17-26	4,420	...	1979	63.1	Main-stem Stikine R. near Porcupine Mouth	96.5
4-17-27	4,536	...	1979	63.1	Main-stem Stikine R. near Porcupine mouth.	96.5
4-19-62	5,001	...	1979	63.1	Main-stem Stikine R. near Porcupine mouth.	96.5
4-19-63	8,865	...	1979	63.1	Main-stem Stikine R. near Porcupine mouth.	96.5
4-20-2	7,430	...	1979	63.1	Main-stem Stikine R. near Porcupine mouth.	96.5
11-16-25	17,487	...	1978	64.4	Main-stem Stikine R. near Porcupine mouth.	...
4-21-11	8,643	...	1980	57.8	Main-stem Stikine R. near Porcupine mouth.	93.0
4-21-12	10,083	...	1980	57.8	Main-stem Stikine R. near Porcupine mouth.	93.0
4-21-13	10,736	...	1980	57.8	Main-stem Stikine R. near Porcupine mouth.	93.0
4-21-14	10,175	...	1980	57.8	Main-stem Stikine R. near Porcupine mouth.	93.0
4-21-46	3,451	...	1980	57.8	Main-stem Stikine R. near Porcupine mouth.	93.0

Table 11. A Summary of Coded-Wire-Tag Recoveries of Stikine River Chinook Salmon, 1978 to Date. Abbreviations in Parentheses Mean Head Length (-), Fork Length (FL), and Mid-Eye Length (MF).

Tag Code	Date	Age	Sex	Length (mm)	Recovery Area	Gear	Random or Select	Expansion Factor
4-16-33	5-24-82	1.4	...	925 FL	113	Troll	R	3.48
	7-28-82	1.4	...	...	Stikine River	Fishwheel	R	0
4-16-35	4-12-82	1.4	...	990 MF	114	Hand Troll	R	...
4-16-54	8-11-83	1.3	F	810 MF	Little Tahltan R.	Gaff	R	...
	6-20-84	1.4	...	1,003 FL	NE	Comm. Troll	R	...
4-17-17	6-04-82	1.4	...	255 -	113	Troll	S	0
	6-04-82	1.4	...	830 FL	110	Troll	R	0.75
4-17-20	8-11-83	1.4	M	965 MF	Little Tahltan R.	Gaff	S	...
	8-11-83	1.4	F	820 MF	Little Tahltan R.	Gaff	R	...
4-17-25	6-07-83	1.4	...	930 FL	113	Troll	R	1.42
4-17-26	4-02-84	1.3	...	750 FL	113-97	Comm. Troll	R	...
	6-11-84	1.3	...	725 FL	112	Comm. Troll	R	...
	2-08-84	1.3	F	680 FL	Bering Sea	Trawl	R	...
4-19-63	7-08-83	1.2	...	810 FL	113	Troll	R	4.47
	7-18-83	1.2	...	688 FL	109-10	Troll	R	1.79
	4-15-84	1.3	...	800 FL	114-70	Comm. Troll	R	...
	6-20-84	1.3	...	715 FL	NE	Comm. Troll	R	...
	8-16-84	1.3	F	750 MF	Little Tahltan R.	Gaff	R	...
4-20-2	8-11-83	1.2	M	420 MF	Little Tahltan R.	Gaff	R	...
	7-16-84	1.3	...	676 FL	109-45	Comm. Troll	R	...
	8-09-84	1.3	F	785 MF	Little Tahltan R.	Gaff	R	...
11-16-25	10-01-82	1.2	...	...	Landed Sitka	...	S	0
	3-21-83	1.3	...	820 FL	109-10	Troll	R	1.56
	6-07-83	1.3	...	850 FL	Cout	Troll	R	1.42
	7-07-83	1.3	...	770 FL	113	Troll	R	4.47
	7-08-83	1.3	...	184 -	Landed Sitka	...	S	0
	6-08-84	1.4	...	945 FL	113-91	Comm. Troll	R	...
	6-08-84	1.4	...	780 FL	110-31	Comm. Troll	R	...
4-21-46	7-24-83	1.1	...	350 FL	110-31	Seine	R	1.10

Escapement in Other Areas

Peak-escapement counts of chinook salmon in index tributaries monitored annually are presented in Tables 12-13.

Situk River Studies

Introduction:

The Situk River system, which is located about 16 km east of Yakutat, includes Situk and Mountain Lakes, with a combined area of about 485 surface hectares, and about 40 km of river. The Situk River is classified as a moderately productive chinook system with an annual estimated total return of 1,500-10,000 chinook.

Set-Gill-Net Fishery:

A set-net fishery is concentrated at the mouth of the system, and most chinook harvested are maturing Situk River fish. The chinook are taken incidentally to the much larger runs of sockeye and coho salmon. The chinook catch has varied between 164 and 2,499 fish. The recent 10-year average harvest is 674 chinook.

Sport Fishery:

A small but increasingly popular sport fishery for chinook occurs in the Situk River. Since 1977 the sport harvest has ranged between 63 chinook and 557 chinook and averages about 325 annually.

Escapement:

A weir was operated from 1928 to 1955 in the lower Situk River at the upper limit of the intertidal area. Later a weir was operated below the 9 mile highway bridge, (river mile 14) during 1971 and from 1976 through 1984. All five species of Pacific salmon were counted at the weir. Estimates of the minimum total return of chinook salmon (sport and commercial harvest in the terminal area added to the escapement) have varied between 916 fish and 5,962 fish (Table 14). Chinook escapements, by week, through the Situk weir are presented in Table 15.

Juvenile Chinook Studies:

Seining and coded-wire tagging of young-of-the-year chinook salmon were conducted from May 21 to July 9, 1984 in the lower kilometer of the Situk river, from the Cable Hole to the landing. Seining efforts during the first 3 weeks produced very large numbers of sockeye smolts, good numbers of coho smolts, and less than 0.1% chinook smolts (Tables 16 and 17). The few chinook smolts that were captured during the first 3 weeks were 120-150-mm fork length.

Large numbers of Age-0 chinook (averaging 81.0 mm fork length) did not appear in the lower kilometer of the river until June 20. By late June, the juvenile chinook began displaying characteristics of smolts and were

Table 12. Gill-Net Harvest and Peak Escapement Counts of Chinook Salmon in the Alsek River, 1962-1984.

Year	Village System	Mile 112 Creek	Kluckshu System	Blanchard System	Takhanne River	Goat Creek	U.S. Gill-Net Harvest	Canadian Harvest
1962	...	...	86	...	...	...	2,278	...
1963	...	...	...	...	...	...	125	...
1964	...	...	20	1	...	...	591	...
1965	...	...	100	100	250	...	719	...
1966	...	...	1,000	100	200	...	934	...
1967	...	...	1,500	200	275	...	225	...
1968	...	...	1,700	425	225	...	215	...
1969	...	72	700	250	250	...	685	...
1970	100	...	500	100	100	...	1,128	...
1971	50	60	300	...	...	...	1,222	...
1972	...	32	1,100	...	250	...	1,827	...
1973	...	...	...	...	49	...	1,754	...
1974	14	183	62	52	132	...	1,162	...
1975	17	...	58	81	177	...	1,379	...
1976	...	...	1,244 weir	...	...	...	512	300
1977	...	...	3,144 weir	...	...	...	1,402	400
1978	...	...	2,976 weir	...	...	...	2,441	500
1979	...	...	4,403 weir	...	...	...	2,525	300
1980	...	...	2,637 weir	...	...	...	1,382	300
1981	0	...	2,113 weir	35	11	...	761	333
1982	...	...	2,369 weir	59	241	13	532	200
1983	...	...	2,537 weir	108	185	...	93	600
1984	...	...	1,672 weir	304	158	28	60	...

Table 13. Peak-Escapement Counts of Chinook Salmon in Other Southeast Alaska Rivers Monitored Annually.

Year	Chinook	Survey Method
	KING SALMON RIVER (ADMIRALTY ISLAND)	
1957	200	Foot
1961	117	Foot
1971	94	Foot
1972	90	Foot
1973	211	Foot
1974	104	Foot
1975	42	Foot
1976	64	Foot, Helicopter
1977	134	Foot, Helicopter
1978	57	Foot, Helicopter
1979	88	Foot, Helicopter
1980	70	Foot, Helicopter
1981	101	Foot, Helicopter
1982	259	Foot, Helicopter
1983	208 (84.3%)*	Helicopter
1984	198 (76.7%)*	Helicopter
	BLOSSOM RIVER	
1961	68	Ground
1963	825	Air
1972	700	Air
1974	166	Helicopter
1975	153	Helicopter
1976	68	Helicopter
1977	112	Helicopter
1978	143	Helicopter
1979	54	Helicopter
1980	89	Helicopter
1981	159	Helicopter
1982	345	Helicopter
1983	589	Helicopter
1984	508	Helicopter

Table 13. (Cont.) Peak-Escapement Counts of Chinook Salmon in other Southeast Alaska Rivers Monitored Annually.

Year	Chinook	Survey Method
	KETA RIVER	
1948	500	Foot
1950	210	Foot
1951	120	Foot
1952	462	Foot
1953	156	Foot
1954	300	Air
1955	1,000	Air
1956	1,500	Air
1957	500	Air
1961	44	Ground
1975	203	Helicopter
1976	84	Helicopter
1977	230	Helicopter
1978	392	Helicopter
1979	426	Helicopter
1980	192	Helicopter
1981	329	Helicopter
1982	754	Helicopter
1983	822	Helicopter
1984	610	Helicopter

* Percentage of Chinook enumerated from helicopter above weir compared to tal enumerated through weir.

Table 14. Situk River Catch, Escapement and Minimum Total Run.

Year	Commercial Catch	Escapement		Weir Escapement (large+jacks)	Sport Catch	Total Minimum Run (includes jacks)
		Large fish	Jacks			
1915	836			...		...
1916	931			...		...
1917	2,499			...		...
1918	1,036			...		...
1919	316			...		...
1920	782			...		...
1921	1,952			...		...
1922	2,118			...		...
1923	1,761			...		...
1924	1,351			...		...
1925	1,087			...		...
1926	1,851			...		...
1927	1,687			...		...
1928	...			1,224		...
1929	...			3,559		...
1930	...			1,455		...
1931	...			2,967		...
1932	...			1,978		...
1933	267			No Weir		...
1934	450			1,486		1,936
1935	558			638*		1,196
1936	...			816		...
1937	...			1,290*		...
1938	1,220			2,668*		3,888
1939	495			2,117		2,612
1940	164			903		1,067
1941	390			2,594		2,984
1942	430			2,543		2,973
1943	947			3,546*		4,493
1944	844			2,906		3,750
1945	692			1,458		2,150
1946	1,468			4,284		5,752
1947	885			5,077		5,962
1948	694			3,744		4,438
1949	410			1,978		2,388
1950	378			2,011		2,389
1951	948			2,780		3,728
1952	225			1,459		1,684
1953	378			1,040		1,418
1954	314			2,101		2,415
1955	740			1,571		2,311
1956	1,867			...		...
1957	1,796			1,500**		...
1958	187			300**		...
1959	426			...		...

Table 14. (Cont.) Situk River Catch, Escapement and Minimum Total Run.

Year	Commercial Catch	Escapement		Weir Escapement (large+jacks)	Sport Catch	Total Minimum Run
		Large fish	Jacks			
1960	312			500**		...
1961	368			400**		...
1962	337			1,000**		...
1963	459			...		...
1964	706			725**		...
1965	442			1,500**		...
1966	410			800**		...
1967	203			200**		...
1968	312			700**		...
1969	1,020			2,500**		...
1970	927			1,100**		...
1971	473			964		1,437
1972	303			400F		703
1973	752			510F		1,262
1974	791			702F		1,493
1975	562			1,180F		1,742
1976	1,002	1,543[a]	390[a]	1,933		2,935
1977	833	1,732	148	1,880	353	3,066
1978	382	880[a]	223[a]	1,103	257	1,742
1979	1,028	1,400[a]	354[a]	1,754	445	3,227
1980	971	905	220	1,125*	439	2,535
1981	859	702	105	807*	162	1,828
1982	242	434	177	611	63	916
1983	349	592	257	849	...	1,198
1984	513P	1,726	475	2,201	557	3,271

* Weir out part of the time (corrections were made for period the weir was inoperable in 1980 and 1981).
** Peak aerial survey.
F Float survey.
a Separation of large fish and jacks not made during enumeration. Estimate derived from 1977 and 1980-1984 average percentages of jacks and fish.
P Preliminary.

Table 15. Escapement, by Week, of Chinook Salmon through the Situk River Weir (Including Jacks).

Year	June		July					August				Total
	17	24	1	8	15	22	29	5	12	19	26	
1934	27	104	328	531	251	163	82	...	...	...	...	1,486
1935	12	24	140	87	203	69	67	36	*	...	...	638
1936	24	80	181	281	134	84*	32	...	...	...	...	816
1937	29*	113	221	444	483	...	...	...	...	...	...	1,290
1938	11	39	330	778	786	544	180	...	...	...	...	2,668
1939	24	72	250	343	947	313	168	...	...	...	...	2,117
1940	37	76	276	265	163	78	8	...	...	...	...	903
1941	41	61	439	845	617	353	143	61	34	...	...	2,594
1942	...	35	216*	464	562	762	378	126	...	...	...	2,543
1943	24	74		768	1,398	589	481	164	48	...	...	3,546
1944	28	137	474	859	735	297	194	175	7	...	...	2,906
1945	17	31	146	221	335	184	274	179	71	...	...	1,458
1946	...	85	269	535	1,216	961	783	393	42	...	...	4,284
1947	21	131	528	761	1,312	1,408	631	268	17	...	...	5,077
1948	144	232	617	1,092	876	404	248	51	68	12	33	3,744
1949	...	...	...	...	...	...	...	...	...	...	...	1,978
1950	...	...	...	...	...	...	...	...	...	...	...	2,011
1951	158	611	958	520	266	44	84	71	22	13	33	2,780
1952	59	327	447	303	231	38	34	12	8	...	...	1,459
1953	40	91	212	337	240	58	62	...	...	...	...	1,040
1954	...	...	...	...	...	...	...	...	...	...	...	2,101
1955	42	153	435	189	365	207	169	7	2	2		1,571
1971	4	13	59	62	54	93	57	180	442	...	...	964
1976	14	32	252	236	443	304	353	96	180	31	...	1,941
1977	47	162	219	294	288	324	184	311	51	...	...	1,880
1978	13	36	108	102	147	160	244	212	81	...	...	1,103
1979	2	25	212	38	187	264	282	357	387	...	...	1,754**
1980	1	48	51	52	105	277	159	...	...	...	...	693***
1981	15	41	11	121	122	97	106	146	25	...	...	684
1982	2	12	33	52	39	92	42	165	80	94	...	611
1983	3	39	22	15	57	214	112	332	55	...	...	849
1984	11	40	85	359	108	331	590	638	39	...	...	2,201

* Weir out. No adjustment made.

** Weir out. Correction factor made for total escapement in 1980; corrected total was 1,125.

*** Weir out. Correction factor made for total escapement in 1981; corrected total was 807.

Table 16. Juvenile Sockeye Salmon Tagged and Recaptured, and Tag Retention, by Date, on the Situk River, 1984.

Date	Number Tagged	Number Recaptured		Tag Code
		Total	Tags Retained	
May				
22	758	...	...	4-24-9
23	...	...	...	...
24	1,160	12	12	4-24-9
25	4,359	45	42	4-24-9
29	3,071	27	24	4-24-9
30	1,505	22	20	4-24-9
30	863	...	...	4-24-2
31	2,533	14	12	4-24-2
June				
1	...	...	...	...
2	...	...	...	...
3	1,580	10	9	4-24-2
4	1,854	29	25	4-24-2
5	...	...	...	...
6	2,897	122	103	4-24-2
7	1,035	130	118	4-24-2
7	1,380	...	...	4-24-3
8	1,235	31	23	4-24-3
9	...	...	...	...
10	...	...	...	...
11	134	5	5	4-24-3
12	2,566	37	31	4-24-3
13	1,600	45	38	4-24-3
14	1,256	37	32	4-24-3
15	1,694	65	60	4-24-3
16	...	...	...	...
17	...	...	...	...
18	794	...	...	4-24-3
18	387	28	27	4-24-4
19	808	51	51	4-24-4
20	855	62	61	4-24-4
21	558	28	28	4-24-4
22	135	12	12	4-24-4
Total	35,017	812	733	...

moving actively in the lower kilometer, aided by the tide. Because of a week-long high-water period beginning on July 9 and the high percentage of recaptured fish during the first week of July (average 22%), it was decided to terminate the project; thus, movement was not monitored after July 9. However, it is believed that the juvenile chinook migrated seaward. A similar behavior was noted in 1983, when large numbers of juvenile chinook were in the intertidal area from June 29 through July 22 and migrated out of the area after a major flood.

Generally, less than 0.5 hours per day were spent seining juvenile chinook, and the remainder of the day was spent tagging them. A total of 12,552 chinook smolts were captured and tagged (Table 18).

Situk River chinook are unique compared to other stocks studied, to date, in southeast Alaska. We have not detected out-migrations at Age-0 in significant numbers in any other system, nor have we observed large numbers of smolts rearing in the intertidal area.

Unuk River Studies

Introduction:

The Unuk River is the largest chinook system in Behm Canal. Only the three major transboundary rivers, the Taku, Stikine, and Alsek Rivers, have larger chinook runs in Southeastern. The 129-km-long Unuk River drains an area of about 3,885 km of a very glaciated region of northern British Columbia, and only the lower 39 km are in Alaska. The river discharges its flow into Burroughs Bay, 85 km northeast of Ketchikan.

Drift-Gill-net Fishery:

A drift-gill-net fishery operated in Burroughs Bay from 1952 through 1956. During 1954-1956, an average of 1,668 chinook were caught, and most of the harvest occurred during July.

Escapement:

Chinook salmon are enumerated annually in index tributaries by foot and/or helicopter surveys during the peak of spawning activity. The 1984 chinook escapement was 2.1% above the escapement goal and 66% above the 10-year mean escapement (Table 19).

Juvenile Chinook Studies:

Minnow trapping and coded-wire tagging of chinook salmon smolts from the 1982 brood year were conducted on the main stem Unuk River from March 15 through April 30, 1984. A total of 9,391 chinook smolts (averaging 67.4 mm fork length) were captured and tagged (Tables 20-21). An additional 6,508 juvenile coho salmon were captured incidentally and coded-wire tagged (Table 22).

Table 17. Juvenile Coho Salmon Tagged and Recaptured, and Tag Retention, by Date, on the Situk River, 1984.

Date	Number Tagged	Number Recaptured		Tag Code
		Total	Tags Retained	
May 25	369	...	...	4-24-1
29	147	1	1	4-24-1
30	429	1	1	4-24-1
31	812	6	5	4-24-1
June 3	167	...	...	4-24-1
4	624	2	2	4-24-1
6	775	8	8	4-24-1
7	494	21	19	4-24-1
8	544	14	13	4-24-1
11	435	11	11	4-24-1
12	1,077	45	44	4-24-1
13	792	36	36	4-24-1
14	837	55	54	4-24-1
15	345	27	27	4-24-1
18	386	67	66	4-24-1
19	546	99	97	4-24-1
20	477	96	96	4-24-1
21	255	...	...	4-24-1
22	356	103	102	4-24-1
Total	9,867	592	582	...

Table 18. Juvenile Chinook Salmon Tagged and Recaptured, and Tag Retention, by Date, on the Situk River, 1984.

Date	Number Tagged	Number Recaptured		Tag Code
		Total	Tags Retained	
June 14	6	...	...	4-24-5
15	19	...	...	4-24-5
18	60	...	...	4-24-5
19	65	3	3	4-24-5
20	280	6	6	4-24-5
21	389	8	8	4-24-5
22	495	26	25	4-24-5
25	2,788	37	37	4-24-5
26	874	67	67	4-24-5
27	1,484	29	28	4-24-5
28	1,341	158	156	4-24-5
29	1,188	248	245	4-24-5
July 2	688	116	111	4-24-5
3	862	161	129	4-24-5
5	1,160	338	268	4-24-6
6	853	216	189	4-24-6
Total	12,552	1,413	1,272	...

Table 19. Chinook Escapement into Various Tributaries of the Unuk River System, by Year.

Location	1977	1978	1979	1980	1981	1982	1983	1984
Cripple Creek	721	1,058	363	748	324	538	441	644
Genes Lake	339	369	101	158	112	329	337	647
Eulachon Creek	57	218	48	95	196	384	288	350
Clear Creek	34	85	14	28	54	24	24	113
Lake Creek	...	20	30	5	20	48	12	32
Sawmill	15	15	20	18	25	28	4	51
Total	1,166	1,765	576	1,052	731	1,351	1,106	1,837

Table 20. Number of minnow Traps Checked, Juvenile Chinook Tagged and Recaptured, and Tag Retention, by Date, on the Unuk River, 1984.

Date	Minnow Traps Checked	Number of fish Tagged	Number Recaptured		Tag Code
			Total	Tags Retained	
March 16	41	0	...	...	...
17	26	0	...	...	...
18	50	552	54	53	4-21-58
19	52	279	17	17	4-21-58
20	21	94	3	3	4-21-58
21	58	311	32	26	4-21-58
22	82	75	0	0	4-21-58
23	91	540	33	32	4-21-58
24	85	145	6	5	4-21-58
25	...	174	22	21	4-21-58
26	87	154	13	12	4-21-58
27	5	...	...	...	...
28	103	..	...	...	...
29	125	426	87	87	4-21-58
30	110	...	3	3	4-21-58
31	56	...	...	...	...
April 1	65	321	87	77	4-21-58
2	29	...	...	...	...
3	73	...	...	...	...
4	68	277	57	56	4-21-58
5	59	...	...	...	...
6	23	496	10	10	4-21-58
7	98	510	14	14	4-21-58
8	40	786	17	16	4-21-58
9	...	...	...	...	...
10	87	...	...	...	...
11	86	739	32	30	4-21-58
12	73	532	22	21	4-21-58
13	77	...	...	...	...
14	84	506	28	27	4-21-58
15	61	...	...	...	...
16	54	...	...	...	...
17	67	912	68	66	4-21-58
18	69	...	...	...	...
19	66	...	...	...	...
20	59	595	35	33	4-21-58
21	56	...	...	...	...
22	...	249	22	17	4-21-58
23	...	...	...	...	...
24	...	...	...	...	...
25	57	...	...	...	...
26	58	...	...	...	...
27	52	524	61	59	4-21-49
28	47	194	15	15	4-21-49
Total	2,500	9,391	738	700	...

Table 21. Sample Size and Mean Fork Length (mm) by Brood Year and Month of Capture, for Chinook Juveniles Sampled on the Unuk River, 1984.

Brood Year	October		November		December		March		April	
	n	Mean Length	n	Mean Length	n	Mean Length	n	Mean Length	n	Mean Length
1977	...	...	...	...	50	64.7	...	...	...	...
1981	...	...	...	...	246	68.2	...	...	...	...
1982	200	63.8	300	63.8	...	...	...	...	650	67.4

Table 22. Minnow Traps Checked, Juvenile Coho Tagged and Recaptured, and Tag Retention, by Date, on the Unuk River, 1984.

Date	Minnow Traps Checked	Number of fish Tagged	Number Recaptured		Tag Code
			Total	Tags Retained	
March 16	41	...	...	...	...
17	26	...	...	...	...
18	50	...	19	19	4-21-47
19	52	350	16	16	4-21-47
20	21	...	6	6	4-21-47
21	58	...	13	12	4-21-47
22	82	321	...	...	...
23	91	...	...	...	...
24	85	...	...	...	...
25	...	511	34	30	4-21-47
26	87	251	8	7	4-21-47
27	5	...	...	...	...
28	103	...	...	...	...
29	125	...	...	...	...
30	110	741	69	62	4-21-47
31	56	...	...	...	...
April 1	65	...	...	...	...
2	29	...	...	...	...
3	73	491	29	26	4-21-47
4	68	...	...	...	...
5	59	...	...	...	...
6	23	...	...	...	...
7	98	...	...	...	...
8	40	485	17	13	4-21-47
9	...	...	...	...	...
10	87	343	9	9	4-21-47
11	86	...	...	...	...
12	73	...	...	...	...
13	77	685	13	12	4-21-47
14	84	...	...	...	...
15	61	472	16	16	4-21-47
16	54	...	...	...	...
17	67	...	...	...	...
18	69	...	...	...	...
19	66	...	...	...	...
20	59	692	63	61	4-21-47
21	56	522	35	35	4-21-47
22	...	...	...	...	...
23	...	...	...	...	...
24	...	...	...	...	...
25	57	...	...	...	...
26	58	...	...	...	...
27	52	644	70	66	4-21-47
28	47	...	...	...	...
Total	2,500	6,508	417	390	...

All capturing of juvenile chinook occurred below the First Canyon because previous distribution studies (Table 23) indicated that the density of juvenile chinook above the First Canyon was low. Additionally, Lava Falls, which is just below the First Canyon, is unnavigable at most water stages.

A controversy has existed for the past 2 years regarding removal of juvenile chinook salmon habitat by salvage logging on the Unuk and Chickamin Rivers. Salvage logging is the removal of timber that has fallen into the riverbed through the process of erosion. Logs to be salvaged (primarily Sitka Spruce) are cut from their root wads along the flood plains of the Chickamin and Unuk Rivers. Logs not already near the rivers are moved to or near the edge of the water and the logs are carried downstream as the rivers rise. Logs are collected near the river mouth and held for later transport.

Permitted log-salvage activities on record in the Unuk River date back to 1972. The permittee was allowed to salvage downed timber from the Unuk River tide flats.

In 1975, the Department reviewed a proposal to salvage logs along the Unuk River. At that time, the primary concern of the Department was to protect migrating and spawning adult chum and chinook salmon. The Department had no objections to the proposal provided no in-stream salvage operations were conducted during the period June 14 through November 1.

In 1979, the license application was expanded to include the Chickamin River.

On March 2, 1983, Paul Kissner, Don Siedelman, and Jerry Koerner of the Department of Fish and Game began capturing juvenile chinook and coho salmon on the Chickamin River for coded-wire tagging to determine their ocean-migration patterns, timing of harvest, exploitation rates, and other general life history information. At that time, Siedelman described the log-salvage activities to Kissner and Koerner. Kissner immediately expressed to Siedelman the importance of these downed trees to chinook production (rearing habitat) and relayed his concerns in mid-March to Frank Van Hulle, Southeast Regional Supervisor for the Division of Sport Fish. This started the Unuk and Chickamin River log-salvage controversy.

During 1972-1984, nearly 400,000 juvenile chinook salmon were captured at various times of the year in the three major transboundary chinook systems in Southeast (the Taku, Stikine and Alsek Rivers) and five moderately productive systems like the Situk, Unuk, Chickamin, Chilkat and Harding Rivers (Kissner, 1976, 1977, 1978, 1979, 1980; Kissner and Bethers, 1981; Kissner, 1982, 1984). The majority of the juvenile chinook were captured by minnow traps baited with salmon roe (over 56,000 sets of 24-hour duration), and smaller numbers were taken by seine or weir. The major objective of the project was to capture juvenile chinook for coded-wire tagging to determine their ocean-

Table 23. Summary of Minnow Traps Set, Catch per Trap, Sample Size and Mean Fork Length of Juvenile Chinook Captured in Various Areas of the Unuk River Drainage, by Date.

Date	Number of Traps	Catch per Trap	Sample Size	Mean Fork Length (mm)
05/05/77	20	0.20	...	...
05/25/77	20	0.65	...	...
12/1-2/78	68	4.56	50	64.7
03/27-28/80	65	5.28	...	...
12/13-14/82	70	3.51	246	68.2
10/5-11/20/83	2,232	9.42	500	63.8
03/16-04/28/84	2,500	3.76	650	67.4

migration patterns, harvest rates, and other life-history information. The Southeast Chinook Salmon Project has not recorded large numbers of physical measurements of habitat parameters, such as optimal depth, substrate, velocity, or cover; however, based on 11 years of experience at capturing juvenile chinook salmon throughout southeast Alaska in all types of habitat, we know where juvenile chinook salmon reside during their freshwater residency in these systems.

Obviously, chinook salmon habitat requirements are much more specific than the requirements of other salmonids--only 34 chinook salmon systems are documented in Southeast. Chinook occupy a very narrow range of habitats unlike juvenile coho salmon, which are found in a variety of habitat types, such as lakes, beaver ponds, shallow and warm weedy areas, lateral tributaries, and main-stem areas. We do not find juvenile chinook salmon in lakes, beaver ponds, or shallow weedy areas, and only small numbers of them are found in most lateral tributaries. In our large river systems, such as the Taku, Stikine, Chickamin, and Unuk Rivers, most juvenile chinook are found in the main-stem, usually associated with large or small organic debris. This woody debris functions as cover from predators and decreases water velocities, which would often preclude rearing in many microhabitats. From these areas, chinook juveniles move out into faster waters to feed and then return to these holding areas to conserve energy.

During the summer and fall in these main-stem areas, we have found the highest densities of juvenile chinook in areas where the rivers are the most braided, if cover (large or small organic debris) is available (shelter from high water velocity). The more the river is confined to one channel and the fewer the log jams and the lower the amount of cover, the lower the density of rearing chinook. If large organic debris is missing from these areas (such as would occur after salvage logging), there would be fewer braids (braids are usually formed by large organic debris), increased water velocity, and fewer juvenile chinook. In other words, most rearing juveniles would be forced to move to areas with decreased water velocity, primary rearing areas would be lost, and production of juvenile chinook would decrease.

In late fall, as water temperatures approach 32-34°F and water levels drop, juvenile chinook leave their summer and fall habitat and seek deeper water, with cover and little velocity, to overwinter. Most of the overwintering holes that we have observed have been formed by the river cutting a hole around large organic debris. Studies of five brood years of Taku River chinook indicate that a major factor in juvenile chinook salmon production is overwinter survival (Kissner, unpublished).

With the root wad attached, a downed tree usually orients itself with the root wad upstream and the stem facing downstream. Turbulence at the upstream end of the root wad erodes the stream bottom away from the area around the root wad and often creates a pool of relatively calm water. Depending upon where the tree was deposited in the river channel, this pool provides food, cover from predators, and a resting area for

4. One of the most important factors in pink and chum salmon production is the availability of high quality spawning gravels. We would not permit removal of gravel from our major pink salmon streams. The most important factor in chinook salmon production is the availability of high-quality rearing habitat. We are allowing removal of habitat in one of Southeast's most important chinook systems.

Chickamin River Studies

Introduction:

The Chickamin River, a glacial mainland river which discharges its flow into Behm Canal about 32 km southeast of Borroughs Bay, is the second largest chinook salmon system in Behm Canal. It ranks fifth in chinook production in Southeast, after the Stikine, Taku, Alsek, and Unuk Rivers.

Escapement:

Chinook salmon are enumerated annually in index tributaries (Kissner, 1984) by foot and/or helicopter surveys during the peak of spawning. The 1984 escapement was 12.7% above the escapement goal and 196% above the 10-year mean escapement (Table 24).

Juvenile Chinook Studies:

Minnow trapping and coded-wire tagging of chinook salmon smolts from the 1982 brood was conducted on the main-stem Chickamin River from March 15 through April 16, 1984. A total of 5,799 chinook smolts (averaging 69.9 mm fork length) were captured and tagged (Tables 25-26). An additional 4,331 juvenile coho salmon were captured incidentally and coded-wire tagged (Table 27).

Capturing of juvenile chinook occurred from the junction of the Leduc River and South Fork of the Chickamin River downriver for approximately 8 km. The highest densities of rearing chinook were observed in the first 2.4 km below the Leduc River and South Fork junction, based on distribution studies conducted to date (Table 28).

Chilkat River Studies

Introduction:

The Chilkat River, a large glacial mainland river at the northern end of Lynn Canal, is technically a transboundary river as several of the tributaries have headwaters in British Columbia. It is classified as a moderately productive chinook system with a total annual return estimated at 1,500-10,000 chinook salmon.

Table 24. Chinook Escapement into Various Tributaries of the Chickamin River, by Year.

Location	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
South Fork	141	46	52	21	63	56	51	84	28	185
Barrier Creek	9	10	66	94	17	62	105	149	138	171
Butler Creek	66	15	30	4	29	104	51	37	91	124
Leduc	6	12	26	42	0	17	25	36	30	15
Indian	90	9	53	20	31	22	12	...	47	103
Above Indian	11	...	8	...	...	...	...	...	...	...
Humpy	7	...	0	...	...	...	...	...	...	88
King	30	...	...	...	...	...	105	165	212	388
El Paso	...	30	...	...	...	...	...	...	...	...
Clear Falls	...	...	...	...	...	...	31	33	10	28
Total	360	122	235	181	140	261	380	504	556	1,014

Table 25. Minnow Traps Checked, Juvenile Chinook Tagged and Recaptured, and Tag Retention, by Date, on the Chickamin River, 1984.

Date	Minnow Traps Checked	Number of fish Tagged	Number Recaptured		Tag Code
			Total	Tags Retained	
March 17	84	0	...	...	...
18	84	0	...	...	...
19	84	0	...	...	...
20	84	0	...	...	...
21	...	1,147	1	0	4-20-62
22	21	817	...	...	...
23	...	0	...	...	...
24	63	0	...	...	...
25	26	761	26	21	4-20-62
26	74	0	...	...	...
27	57	516	55	53	4-20-62
28	24	0	...	...	...
29	44	0	...	...	...
30	44	0	...	...	...
31		458	16	15	4-20-62
		0	...	...	...
April 1	63	0	...	...	...
2	64	0	...	...	...
3	61	0	...	...	...
4	63	614	31	28	4-20-62
5	65	0	...	...	...
6	60	0	...	...	...
7	72	0	...	...	...
8	17	721	60	58	4-20-62
9	69	0	...	...	...
10	54	0	...	...	...
11	55	0	...	...	...
12	59	0	...	...	...
13	72	0	...	...	...
14	...	630	46	46	4-20-62
15	68	0	...	...	...
16	39	135	14	14	4-20-62
		0	...	...	...
Total	1,570	5,799	249	235	4-20-62

Table 26. Sample Size and Mean Fork Length (mm) by Brood Year and Month of Capture, for Chinook Juveniles Sampled on the Chickamin River, 1984.

Brood Year	December		March		April	
	n	Mean Length	n	Mean Length	n	Mean Length
1981	205	67.1	...	...	115	68.6
1982	...	...	199	68.8	100	72.1

Table 27. Minnow Traps Checked, Juvenile Coho Salmon Tagged, Recaptured, and Tag Retention, by Date, on the Chickamin River, 1984.

Date	Minnow Traps Checked	Number of Fish Tagged	Number Recaptured		Tag Code
			Total	Tags Retained	
March 17	84	0	...	...	...
18	84	0	...	...	...
19	84	0	...	...	...
20	84	0	...	...	...
21	...	0	...	...	...
22	21	0	...	...	...
23	...	1,525	5	0	4-20-63
24	63	0	...	...	...
25	26	427	22	20	4-20-63
26	74	0	...	...	...
27	57	292	42	36	4-20-63
28	24	0	...	...	...
29	44	0	...	...	...
30	44	0	...	...	...
31	...	482	39	34	4-20-63
April 1	63	0	...	...	...
2	64	0	...	...	...
3	61	0	...	...	...
4	63	581	49	46	4-20-63
5	65	0	...	...	...
6	60	0	...	...	...
7	72	0	...	...	...
8	17	537	87	74	4-20-63
9	69	0	...	...	...
10	54	0	...	...	...
11	55	0	...	...	...
12	59	0	...	...	...
13	72	0	...	...	...
14	...	368	73	66	4-20-63
15	68	0	...	...	...
16	39	119	27	25	4-20-63
Total	1,570	4,331	344	301	...

Table 28. Summary of Minnow Traps Set, Catch per Trap, Sample Size, and Mean Fork Length of Juvenile Chinook Salmon Captured in Various Areas of the Chickamin River, by Dates.

Date	Number of Traps	Catch per Trap	Sample Size	Mean Fork Length (mm)
05/05/77	20	0.45	...	...
05/25/77	20	0.65	...	...
12/14-15/82	24	9.21	205	67.1
03/03-04/1/83	1,040	2.26	115	68.6
03/17-04/16/84	1,570	3.69	299	69.9

Escapement:

Spawning chinook salmon are enumerated annually in Big Boulder and Stonehouse Creeks, which are clear water tributaries of the Chilkat River (Table 29). Spawning distribution and timing of chinook spawning in these tributaries has been presented in Kissner (1984).

A chinook salmon escapement goal was developed in 1984 for Big Boulder Creek, based on historical escapement data, spawning area, and knowledge of juvenile chinook life history. The current escapement goal of 225 3- and 4-ocean spawners was developed so that spawning area would be maximized by about 500 large chinook and fry, upon emergence, would migrate out of Big Boulder Creek and rear for 1 year in the Klehini River or main-stem Chilkat River. Thus, it is felt that main-stem rearing habitat is limiting the production of Chilkat chinook salmon.

Juvenile Chinook Studies:

Young-of-the-year Chilkat River chinook salmon were captured on October 4 and 5 throughout the drainage to determine if the density of juvenile chinook was high enough to capture significant numbers for coded-wire tagging (Table 30).

Concentrations of juvenile chinook in the main-stem Chilkat River and lower end of the Klehini River were associated with large and small organic debris. The density of juvenile chinook was excellent in areas with cover (large and small organic debris), but the Chilkat River and the Klehini River have much less large and small organic debris than other, similar rivers in Southeast. Thus, the juveniles are concentrating in the small amount of available cover. It is therefore recommended that coded-wire tagging of juvenile chinook not be conducted.

Table 29. Peak-Escapement Counts of Chinook Salmon in the Chilkat River, by Years.

Year	Big Boulder Creek	Stonehouse Creek	Survey Method
1960	316	...	Foot
1966	330	...	Foot
1967	150	...	Foot
1968	259	...	Foot
1970	176	...	Foot
1974	0	...	Foot
1975	21	...	Foot
1976	25	...	Foot, helicopter
1977	25	...	Foot, helicopter
1981	187	69	Foot, helicopter
1982	56	123	Foot, helicopter
1983	121	126	Foot, helicopter
1984	229	104	Foot, helicopter

Table 30. Juvenile Chinook, Coho, and Dolly Varden Captured by Minnow Traps in the Chilkat River, October 4, 1984.

Area	Number of Traps	Chinook Salmon	Coho Salmon	Dolly Varden
Takhin River (1 mile up)	6	38	38	84
Klukwan (5 miles below)	12	223	81	166
Klukwan (2 miles below)	5	49	12	118
Klehini River (1 mile from mouth)	12	101	26	344
Klehini River (8 miles from mouth)	3	0	5	50
Klehini River (9.5 miles from mouth)	4	23	2	38
Klehini River (10.1 miles from mouth)	6	0	21	110
Wells bridge (2 miles above)	12	111	46	19
Chilkat River (just below Tahini River)	10	17	78	36
Tahini River	6	50	178	84
All areas	76	612	487	1,049

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